



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,637	06/20/2003	David A. Hayner	1280.SC12755TS	7168

34814 7590 06/29/2006

LARSON NEWMAN ABEL POLANSKY & WHITE, LLP
5914 WEST COURTYARD DRIVE
SUITE 200
AUSTIN, TX 78730

EXAMINER

CHU, KIM KWOK

ART UNIT	PAPER NUMBER
----------	--------------

2627

DATE MAILED: 06/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/600,637	Applicant(s) HAYNER ET AL.	
	Examiner Kim-Kwok CHU	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE Three MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/20/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless--
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

2. Claims 1-12 and 21-37 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ikeda et al. (U.S. Patent 5,970,032).

Ikeda teaches a disk servo control method having all of the steps as recited in claims 1-12. For example, Ikeda teaches the following:

(a) as in claim 1, receiving a first control signal (track servo) to facilitate implementation of a function of a first actuator 208 of an optical pickup unit 118 (Figs. 3A, 3B and 5; step 1 seeking for designated track);

(b) as in claim 1, receiving a second control signal (focus servo) to facilitate implementation of a function of a second actuator 210 of the optical pickup 118 (Figs. 3A, 3B and 5; step 2);

(c) as in claim 1, determining a first modified control signal (tracking servo) based upon the first control signal and the second control signal (Fig. 3A;

tracking servo is constantly modified based on previous tracking and focusing conditions);

(d) as in claim 1, wherein the first modified control signal facilitates decoupling (stopping) the second actuator from the first actuator (Figs. 3A and 5; either tracking or focusing is stopped during a disk servo activity);

(e) as in claim 2, determining a second modified control signal (focus servo) based upon the first control signal (tracking servo) and the second control signal (focus servo), wherein the second modified control signal facilitates decoupling the first actuator TC from the second actuator FC (Figs. 3A and 5; focus servo is constantly modified based on previous tracking and focusing conditions; proper focusing will stop tracking operation);

(f) as in claim 3, the first actuator comprises a tracking actuator 124 of the optical pickup (Fig. 3B);

(g) as in claim 4, the second actuator 126 comprises a focus actuator of the optical pickup (Fig. 3B);

(h) as in claim 5, receiving a third control signal to facilitate implementation of a function of a third actuator (carriage servo 150) of the optical pickup (Fig. 3A and 3B; coarse tracking actuator is an inherent means);

(i) as in claim 5, determining the first modified control signal based upon the first control signal, the

second control signal and the third control signal, wherein the first modified control signal facilitates decoupling the first actuator from the second actuator and the third actuator (Figs. 3A, 3B and 5; coarse tracking is included in the seek servo controller 172);

(j) as in claim 6, the first actuator comprises a fine tracking actuator 124 and the third actuator comprises a gross tracking actuator 150 (Fig. 3A; carriage servo is the coarse tracking);

(k) as in claim 7, determining the second modified control signal based upon the second control signal, the first control signal and the third control signal, wherein the second modified control signal facilitates decoupling the second actuator from the first actuator and the third actuator (Figs. 3A and 5; either tracking or focusing is stopped during a disk servo activity);

(l) as in claim 8, determining the first modified control signal (tracking servo) further comprises generating a difference signal and modifying the first control signal according to the difference signal and a control law (Figs. 3A and 11; tracking seeking requires difference signals such as offset values);

(m) as in claim 9, determining the first modified

control signal further comprises determining (processing) the first modified control signal (tracking servo) prior to input to an actuator driver (Fig. 3A);

(n) as in claim 10, determining the first modified control signal (tracking servo) further comprises modifying the second control signal (focus servo) by a linear value (sampling rate) to create a modifier (sampling) and modifying the first control signal by the modifier (Fig. 3A; sampling the tracking signal in order to obtain tracking servo);

(o) as in claim 11, determining the first modified control signal (tracking servo) further comprises modifying the second control signal (focus servo) by a specific process (digital processing) to create a modifier (sampling rate) and modifying the first control signal (tracking servo) by the modifier (Fig. 3A; focusing and servo processing have the same sampling rate);

(p) as in claim 12, receiving a first position signal sensed by a first sensor (photodetector is a first sensor) of the OPU wherein the first control signal is based on the first position signal (Fig. 3A; fine tracking); and

(q) as in claim 12, receiving a second position (focusing servo) signal sensed by a second sensor (focusing sensor) of the optical pickup wherein the second control signal is based on the second position signal (Fig. 3B).

3. Claims 21 and 22 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above.

4. Claims 23-25 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claim 23 however also recites the following limitations which are also disclosed by the prior art of Ikeda:

(a) as in claim 23, wherein the focus control loop and the tracking control loop are cross-coupled (Fig. 3A; loop signals are cross coupled connections);

5. Claims 26-30 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claim 26 however also recites the following limitations which are also disclosed by the prior art of Ikeda:

(a) as in claim 26, determining cross-coupling characteristics of a focus actuator and a tracking actuator of an optical pickup unit (Fig. 3A; servo loop characteristics is the cross-coupling characteristics);

(b) as in claim 26, determining a decoupling matrix to decouple the focus actuator and the tracking actuator (Fig.

3A; DSP 140 and servo processor 142 include de-coupling matrix of tracking and focusing).

6. Claims 31-35 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claims 32-35 however also recite the following limitations which are also disclosed by the prior art of Ikeda:

(a) as in claim 32, the decoupler (servo operation) modifies a focus command to have a reduced effect on a tracking position of the lens assembly and modifies a tracking command to have a reduced effect on a focus position of the lens assembly (Figs. 3A and 3B; a reduced effect such as an error effect);

(b) as in claim 33, the decoupler is a software routine stored on computer readable media (Figs. 3A, 3B and 10 (Figs. 3A and 3B; servo operation is written in the software such as seek to test zone as illustrated in Fig. 5, step S1);

(c) as in claim 34, the decoupler is an analog circuit (Fig. 3A; servo processing 142 includes analog circuit);
and

(d) as in claim 35, the decoupler is an electro-mechanical circuit (Fig. 3B; actuator 124 and 126 are electro-mechanical circuit).

7. Claims 36 and 37 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claim 36 however also recites the following limitations which are also disclosed by the prior art of Ikeda:

(a) as in claim 36, determining cross-coupling characteristics of a focus actuator and a tracking actuator of an optical pickup unit (Fig. 3A; servo loop characteristics is the cross-coupling characteristics); and

(b) as in claim 36, determining a decoupling matrix to decouple the focus actuator and the tracking actuator (Fig. 3A; DSP 140 and servo processor 142 include de-coupling matrix of tracking and focusing).

8. Claims 13-20 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ikeda et al. (U.S. Patent 5,970,032).

Ikeda teaches a disk servo control method having all of the steps as recited in claims 13-17. For example, Ikeda teaches the following:

(a) as in claim 13, a first component (focusing) comprising a first component input and a first component output (Figs. 3A and 3B;);

(b) as in claim 13, a second component (tracking) comprising a second component input and a second component output (Figs. 3A and 3B);

(c) as in claim 13, a first component control law (focusing servo 164) portion comprising an input coupled to the first component output and an output (Fig. 3A);

(d) as in claim 13, a second component control law (tracking servo 158) portion comprising an input coupled to the second component output, and an output (Fig. 3A);

(e) as in claim 13, a first component decoupler 142 configured to decouple the first component from the second component (Fig. 3A; servo processing means 142 is a coupling and decoupling means);

(f) as in claim 13, the decoupler 142 comprising a first input coupled to the first component output and a second input coupled to the second component output, and an

output coupled to the first component input (Fig. 3A; servo processor 142 has input and output means connected to all its components inside);

(g) as in claim 13, a second component decoupler (in 142) configured to decouple the second component from the first component, comprising a first input coupled to the first component output and a second input coupled to the second component output, and an output coupled to the second component input (Fig. 3A; servo processor 142 has input and output means connected to all its components inside);

(h) as in claim 14, the first component comprises a focus actuator 126 and the second component comprises a tracking actuator 124 (Fig. 3B);

(i) as in claim 15, the first component comprises a focus sensor 128 and the second component comprises a tracking sensor 132 (Fig. 3B);

(j) as in claim 16, the first component control law (focusing servo) portion 158 and the first component decoupler are integrated onto an information processing device 142 (Fig. 3A); and

(k) as in claim 17, the first component decoupler is integrated onto an actuator driver 210 (Fig. 3A; DSP 140 and drivers and integrated in a circuit board).

9. Method claims 18-20 are drawn to the method of using the corresponding apparatus claimed in claim 12. Therefore method claims 18-20 correspond to apparatus claim 12 and are rejected for the same reason of anticipation as used above.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hirashima et al. (6,760,285) is pertinent because Hirashima teaches a servo control on a disk drive.

Kishimoto et al. (6,714,494) is pertinent because Kishimoto teaches a servo control on a disk drive.

Takeuchi (5,177,718) is pertinent because Takeuchi teaches a servo control on a disk drive.

11. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch, can be reached on (57) 272-7589.

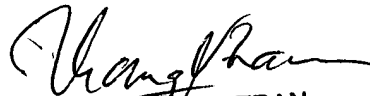
The fax number is:

(571) 273-8300 (for formal communications intended for entry. Or:

(571) 273-7585, (for informal or draft communications, please label "PROPOSED" or "DRAFT").

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9191 (toll free).


THANG V. TRAN
PRIMARY EXAMINER

Kim-Kwok CHU

ke 6/23/06

Examiner AU2627
June 23, 2006

(571) 272-7585